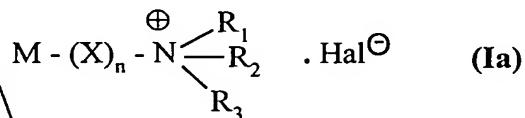


CLAIMS

1- Compounds of formula (Ia) or (Ib) :



wherein :

5 M represents a molecule that can be used for the treatment or diagnosis of pathologies caused by attack on the cartilage,

R₁, R₂ and R₃, which may be identical or different, represent a linear or branched (C₁-C₆)alkyl group,

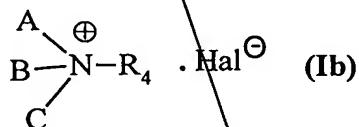
10 or R₁, R₂ and R₃, together with the nitrogen atom carrying them, form a saturated or unsaturated nitrogen-containing heterocycle,

X represents a linear or branched (C₁-C₆)alkylene chain in which one or more -CH₂- groups are optionally replaced by a sulphur atom, an oxygen atom, an -NR- group (wherein R represents a linear or branched (C₁-C₆)alkyl group), a -CO- group, a -CO-NH- group, a -CO₂- group, an -SO- group or an -SO₂- group,

15 n represents 0 or 1, and

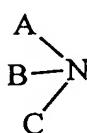
Hal represents a halogen atom,

or,



R₄ represents a linear or branched (C₁-C₆)alkyl group,

20 Hal represents a halogen atom,

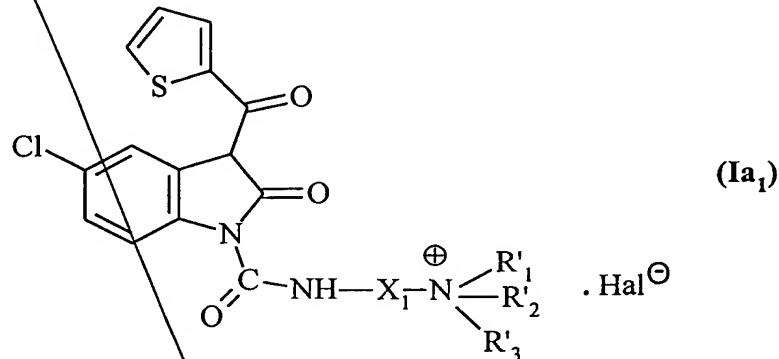


represents a molecule that can be used for the treatment or diagnosis of pathologies caused by attack on the cartilage, wherein the nitrogen atom may optionally be included in a saturated or unsaturated nitrogen-containing heterocyclic system, or included in a double bond.

2- Compound of formula (I) according to claim 1, characterised in that the molecule

M or $\begin{array}{c} A \\ | \\ B-N \\ | \\ C \end{array}$ that can be used for the treatment of pathologies caused by attack on the cartilage
is an antiinflammatory, an analgesic, an antiosteopathic, an antiarthritic or a specific anti-tumour agent.

3- Compound of formula (I) according to claim 1 as represented by formula (Ia₁) :



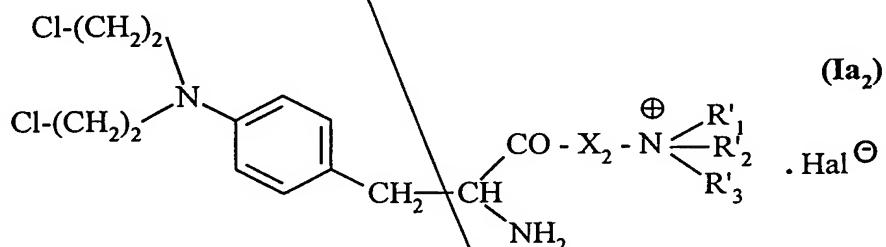
wherein :

X₁ represents a linear or branched (C₁-C₆)alkylene group,

R'₁, R'₂ and R'₃, which may be identical or different, represent a linear or branched (C₁-C₆)alkyl group, and

Hal represents a halogen atom.

4- Compound of formula (I) according to claim 1 as represented by formula (Ia₂) :



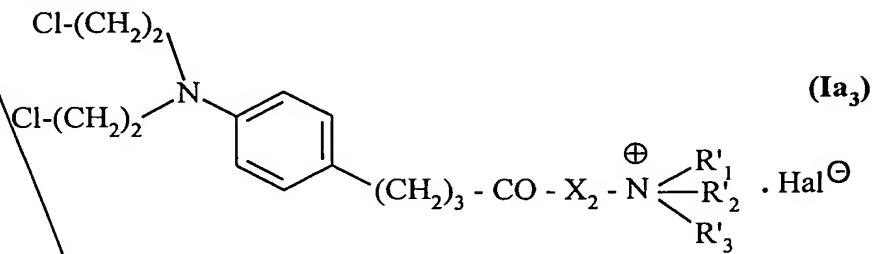
wherein :

X₂ represents a group -NH-(CH₂)_m- wherein m represents an integer from 1 to 5 inclusive,

R'₁, R'₂ and R'₃, which may be identical or different, represent a linear or branched (C₁-C₆)alkyl group, and

Hal represents a halogen atom.

5- Compound of formula (I) according to claim 1 as represented by formula (Ia₃) :



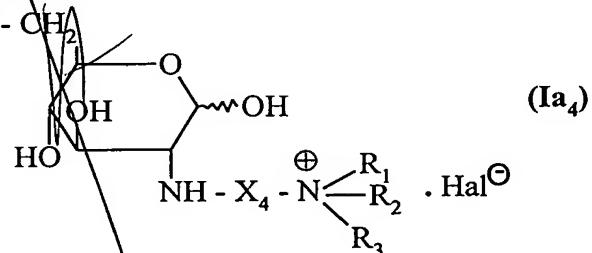
wherein :

X₂ represents a group -NH-(CH₂)_m- wherein m represents an integer from 1 to 5 inclusive,

R'₁, R'₂ and R'₃, which may be identical or different, represent a linear or branched (C₁-C₆)alkyl group, and

Hal represents a halogen atom.

6- Compound of formula (I) according to claim 1 as represented by formula (Ia₄) :



wherein :

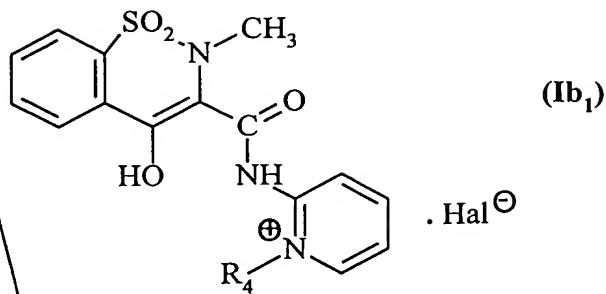
X₄ represents a group -CO-(CH₂)_m- wherein m represents an integer from 1 to 5 inclusive,

R₁, R₂ and R₃, which may be identical or different, represent a linear or branched (C₁-C₆)alkyl group,

or R₁, R₂ and R₃, together with the nitrogen atom carrying them, form a saturated or unsaturated nitrogen-containing heterocycle, and

Hal represents a halogen atom.

7- Compound of formula (I) according to claim 1 as represented by formula (Ib₁) :

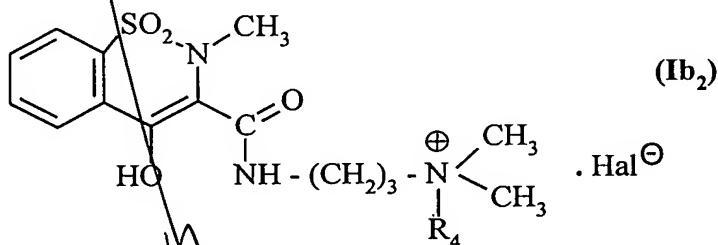


wherein :

R_4 represents a linear or branched ($\text{C}_1\text{-}\text{C}_6$)alkyl group, and

Hal represents a halogen atom.

5 8- Compound of formula (I) according to claim 1 as represented by formula (Ib₂) :

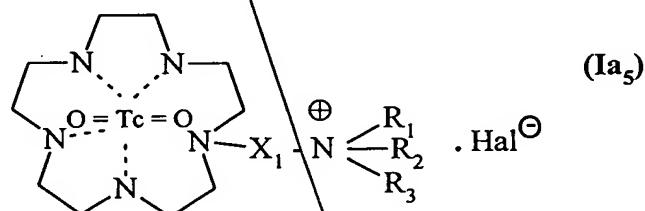


wherein :

R_4 represents a linear or branched ($\text{C}_1\text{-}\text{C}_6$)alkyl group, and

Hal represents a halogen atom.

10 9- Compound of formula (I) according to claim 1 as represented by formula (Ia₅) :



wherein :

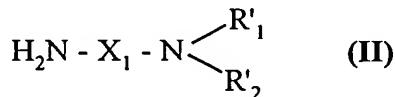
X_1 represents a linear or branched ($\text{C}_1\text{-}\text{C}_6$)alkylene group,

R_1 , R_2 and R_3 , which may be identical or different, represent a linear or branched ($\text{C}_1\text{-}\text{C}_6$)alkyl group,

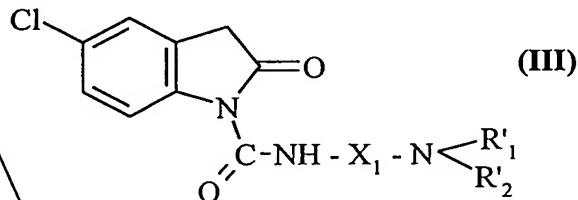
or R_1 , R_2 and R_3 , together with the nitrogen atom carrying them, form a saturated or unsaturated nitrogen-containing heterocycle, and

Hal represents a halogen atom.

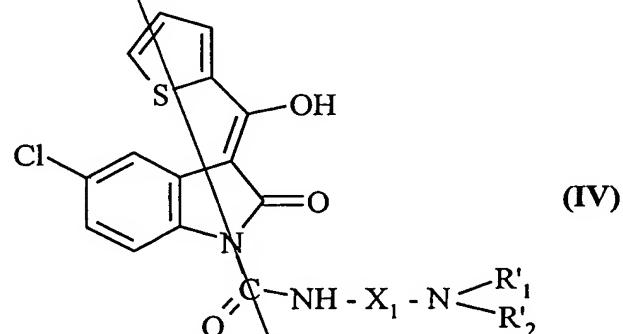
10- Process for the preparation of compounds of formula (Ia₁) according to claim 3, characterised in that they are obtained starting from 4-nitrophenyl 5-chloro-2,3-dihydro-2-oxo-1*H*-indole-1-carboxylate, which is reacted with an amine of formula (II) :



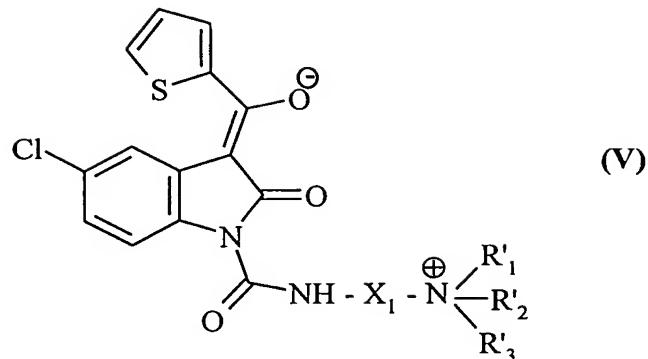
5 wherein X₁, R'₁ and R'₂ are as defined in claim 3,
to yield a compound of formula (III) :



10 wherein X₁, R'₁ and R'₂ are as defined hereinbefore,
which is subjected to the action of 2-thenoyl chloride in basic medium under an inert atmosphere, then to treatment with an acid,
to yield a compound of formula (IV) :

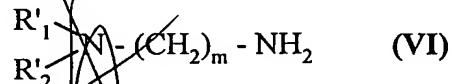


15 wherein X₁, R'₁, and R'₂ are as defined hereinbefore,
which is converted into the corresponding sodium salt,
which is then subjected to the action of a linear or branched (C₁-C₆)alkyl halide of formula R'₃Hal (wherein R'₃ is as defined hereinbefore and Hal represents a halogen atom),
to yield a compound of formula (V) :

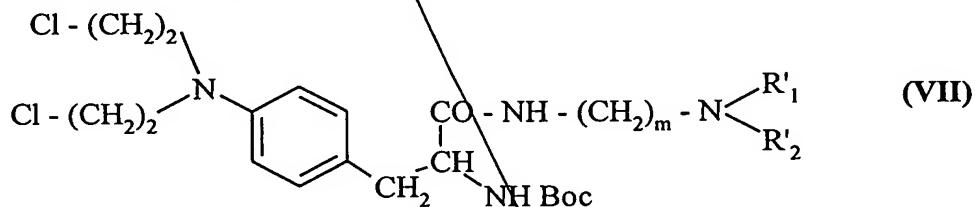


wherein X₁, R'₁, R'₂ and R'₃ are as defined hereinbefore,
which, in hydrochloric medium, yields a compound of formula (Ia₁), which if necessary is purified.

5 11- Process for the preparation of compounds of formula (Ia₂) according to claim 4,
characterised in that they are obtained starting from melphalan, the amine function of
which has been protected beforehand by a *tert*-butoxycarbonyl group (Boc), using an
amine of formula (VI) in the presence of a peptide coupling reagent :



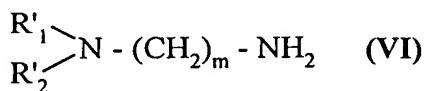
10 wherein R'₁, R'₂ and m are as defined in claim 4,
to yield a compound of formula (VII).



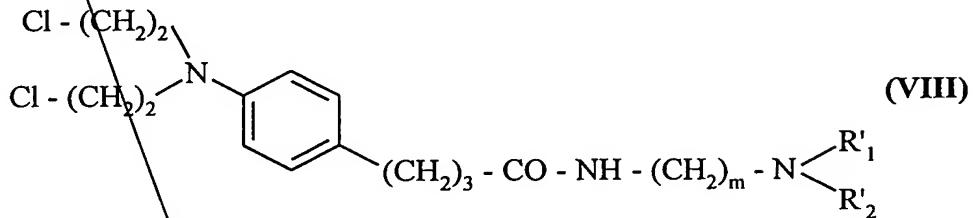
15 wherein m, R'₁ and R'₂ are as defined hereinbefore,
which is subjected to the action of a linear or branched (C₁-C₆)alkyl halide of formula
R'₃Hal (wherein R'₃ is as defined hereinbefore and Hal represents a halogen atom), then to
treatment with HCl,
to yield a compound of formula (Ia₂), which if necessary is purified.

12- Process for the preparation of compounds of formula (Ia₃) according to claim 5,
characterised in that they are obtained starting from chlorambucil, the acid function of

which is converted into the corresponding acid chloride,
which is then reacted with an amine of formula (VI), in the presence or absence of a
peptide coupling reagent :

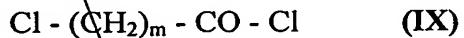


5 wherein R'₁, R'₂ and m are as defined in claim 5,
to yield a compound of formula (VIII) :

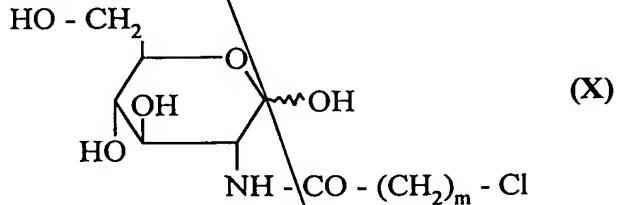


wherein m, R'₁ and R'₂ are as defined hereinbefore,
which is subjected to the action of a linear or branched (C_1 - C_6)alkyl halide of formula
R'₃Hal (wherein R'₃ is as defined hereinbefore and Hal represents a halogen atom),
to yield a compound of formula (Ia₂), which if necessary is purified.

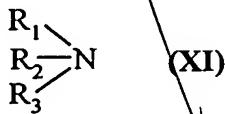
13- Process for the preparation of compounds of formula (Ia₄) according to claim 6,
characterised in that they are obtained by reaction of glucosamine with an acid chloride of
formula (IX) :



15 wherein m is as defined in claim 6,
to yield a compound of formula (X) :



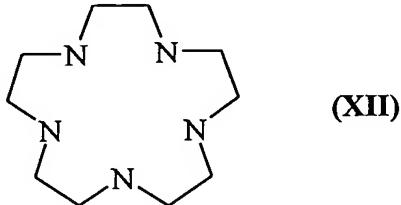
wherein m is as defined hereinbefore,
20 which is condensed with an amine of formula (XI) :



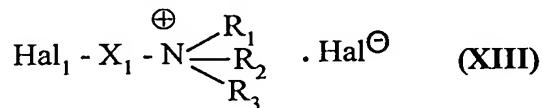
wherein R₁, R₂ and R₃ are as defined in claim 6,
to yield a compound of formula (Ia₄), which if necessary is purified and which is optionally
separated into its isomers according to a conventional separation technique.

5 14- Process for the preparation of compounds of formula (Ia₅) according to claim 9,

characterised in that they are obtained starting from the compound of formula (XII) :

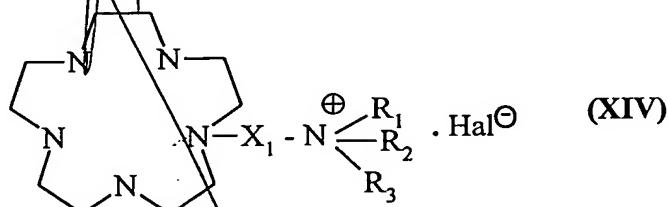


which is reacted with a haloalkylammonium halide of formula (XIII) :



10 wherein X₁, R₁, R₂ and R₃ are as defined in claim 9, and Hal and Hal₁, which may be identical or different, represent halogen atoms

to yield a compound of formula (XIV) :



wherein X₁, R₁, R₂, R₃ and Hal are as defined hereinbefore,
which is reacted with sodium pertechnetate in the presence of tin chloride,
15 to yield a compound of formula (Ia₅), which if necessary is purified.

15- Process for the preparation of compounds of formula (Ib₁) according to claim 7,
characterised in that they are obtained starting from piroxicam, which is reacted with a linear or branched (C₁-C₆)alkyl halide, and are if necessary purified.

20 16- Process for the preparation of compounds of formula (Ib₂) according to claim 8,
characterised in that they are obtained starting from the corresponding amine, which is

reacted with a linear or branched (C_1-C_6)alkyl halide, and are if necessary purified.

17- Pharmaceutical composition comprising as active ingredient a compound according to any one of claims 1 to 9, alone or in combination with one or more pharmaceutically acceptable, inert, non-toxic excipients or carriers.

5 18- Pharmaceutical composition according to claim 17, comprising a compound according to any one of claims 1 to 8, for use in the treatment of pathologies caused by attack on the cartilage.

10 19- Pharmaceutical composition according to claim 17, comprising a compound according to one of claims 1 or 9, for use as a diagnostic reagent capable of revealing a pathology of the cartilage or a metabolism.

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